NEW HOST FOR *SCLEROTINIA SCLEROTIORUM* IN THE NE REGION OF ROMANIA

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Abstract

Sclerotinia sclerotiorum (Lib.) de Bary (1884) is a fungal plant pathogen with worldwide distribution and causes diseses as white mold, Sclerotinia stalk rot, Sclerotinia head rot, watery pod rot or cottony soft rot. *Sclerotinia sclerotiorum* is capabile of infecting many plant species from different botanical families and can cause damage to a large variety of crops as sunflower, soybean, dry bean, canola, some vegetables or in ornamental plants. In Romania, there are very few informations about *Sclerotinia sclerotiorum* in ornamental plants. In the spring of 2021, we found symptoms of white mold on *Forsythia* spp. plants from arboretum park of Iasi University of Life Sciences (IULS), located in Iasi city, Romania. The symptoms appeared in water soaked lesions form on flower petals and leaves, infections that has progressed into branch tissue resulting wilt of individual branches. *Sclerotinia sclerotiorum* isolations were made from leaf and branch tissue fragment from *Forsythia* spp.

Key words: *Sclerotinia sclerotiorum*, new host, ornamental plants, *Forsythia* spp.

Sclerotinia sclerotiorum (Lib.) de Bary (1884) is a fungal plant pathogen with worldwide distribution and causes diseses as white mold, Sclerotinia stalk rot, Sclerotinia head rot, watery pod rot or cottony soft rot. *Sclerotinia sclerotiorum* is capabile of infecting many plant species from different botanical families and can cause damage to a large variety of crops as sunflower, soybean, dry bean, canola, some vegetables or in ornamental plants. Although *Sclerotinia sclerotiorum* infects a large number of herbaceous and woody ornamentals only some information is available about white mold in ornamental plants. A lot of ornamentals plants appear on scientific journals of plant protection from various locations but do not include a description of symptoms or severity of the infection (Boland G.J., Hall R., 1994; Farr D.F., Rossman A.Y., 2017).

The *Forsythia* genus is a group of plants in the olive family (*Oleaceae*) with 11 or so species that are primarily native to eastern Asia, with one species from Europe. In Romania *Forsythia* spp. is a perennial plant appreciated and well known as an ornamental plant named golden rain, but this plant is also used for a wide range of Chinese medicines and health diets (Kim, H. J. *et al*, 2009).

The majority of reports of white mold produced by *Sclerotinia sclerotiorum* on ornamentals come from commercial production of plants in greenhouses or nurseries (Daughtrey M. L. *et al*, 1995). Therefore, less are known about the epidemiology of white mold in ornamental plants grown in landscapes (Grabowski M.A., 2017). In flowering woody ornamentals, descriptions of disease indicate that ascospores initiate infection. In *Forsythia* spp., plants water soaked lesions form on flower petals in cool wet weather; conditions that are favorable for carpogenic germination. Afterwards *Forsythia* spp. infections progress into branch tissue resulting in girdling cankers and wilt of individual branches (Jones R.K., Benson D.M., 2001).

Also, in Romania *Sclerotinia sclerotiorum* is known for the significant damage to plants in field crops, forced crops in greenhouses, as well in warehouses and silos (Sesan T.E., Crisan A., 1998). The number of the *Sclerotinia sclerotiorum* plant host at national level it is certainly higher (Bontea V., 1985) but the reports on the presence of the fungus *Sclerotinia sclerotiorum* on ornamental plants in Romania are extremely scarce, practically it is not cited in some published scientific works.

MATERIAL AND METHOD

Sclerotinia sclerotiorum presence was observed on May 27th 2021 to *Forsythia* spp. plants from arboretum park of Iasi University of Life Sciences (IULS), located in Iasi city, Romania (Coordonate:www.google.com/maps 47°11'30.7"N 27°33'25.2"E).

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Infected tissues of *Forsythia* host plant were collected and brought to the research laboratory of the Phytopathology discipline, within the "Ion Ionescu de la Brad" Iasi University of Life Sciences (IULS). Micromycete identification was done based on visual symptoms, fungal morphology, microscopic preparations and specialized guide book. Also, we followed a standard procedure (Wang A.R. *et al*, 2008) for fungal isolation in order to confirm as soon the presence of *Sclerotinia sclerotiorum* in *Forsythia* plants through a polymerase chain reaction (PCR) test. Therefor the infected tissues of *Forsythia* spp. were cut into small pieces, and then rinsed 3~4 times with diluted water after treated with 70% (v/v) ethanol for 2~3 s. The treated tissues were transferred to potato dextrose agar (PDA) medium and cultured at 25 °C.

RESULTS AND DISCUSSIONS

Environmental conditions of the spring of 2021 were extremely favorable to carpogenic germination of *Sclerotinia sclerotioum* (Lib.) de Bary that occured on *Forsythia* spp. plants from arboretum park of Iasi University of Life Sciences (IULS), located in Iasi city (*figure 1,2,3*).

As well as the growth stage of the plants, temperature and humidity have an important role in the onset of infections through ascospores.

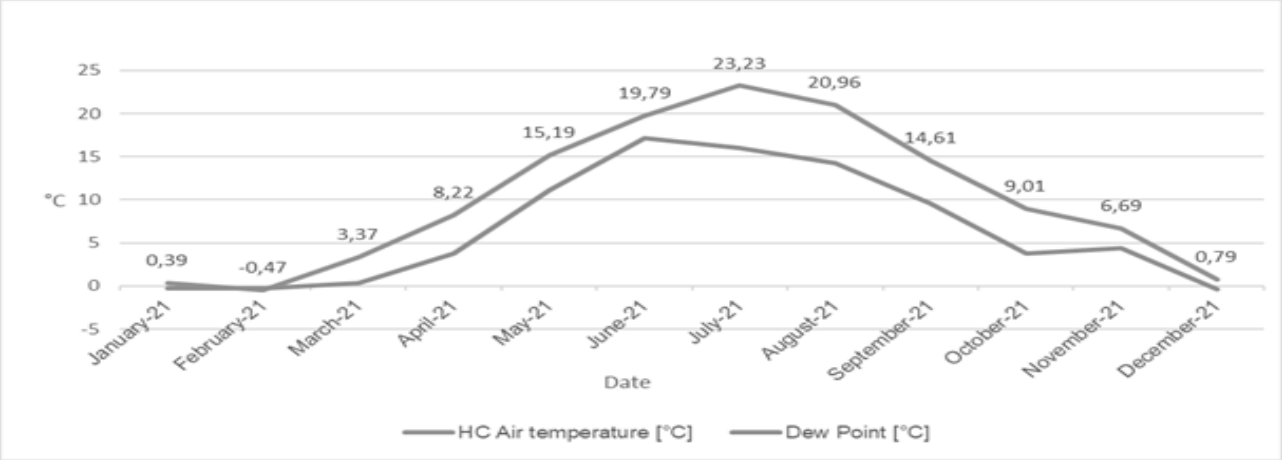

Figure 1 **Average of Air temperature (°C) and Dew Point (°C) registred in 2021 for Iasi, Romania (www.fieldclimate.com)**

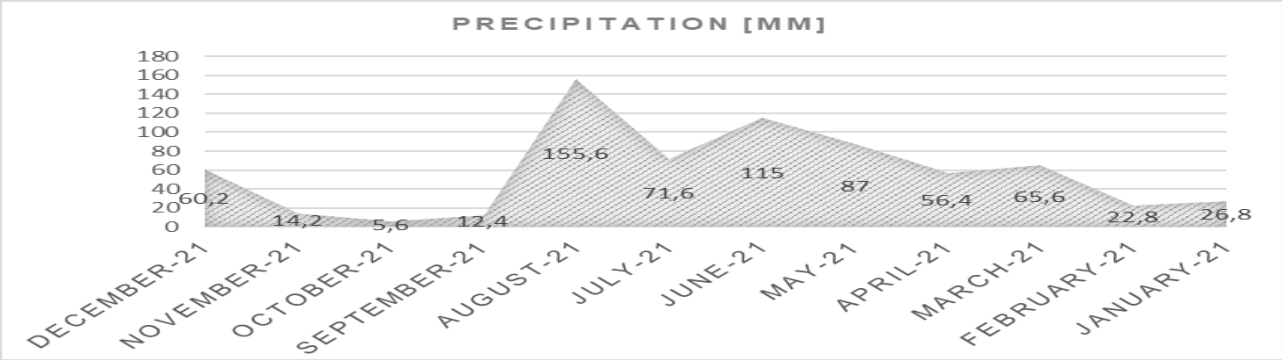

Figure 2 **Average of precipitation (mm) registred in 2021 for Iasi, Romania (www.fieldclimate.com)**

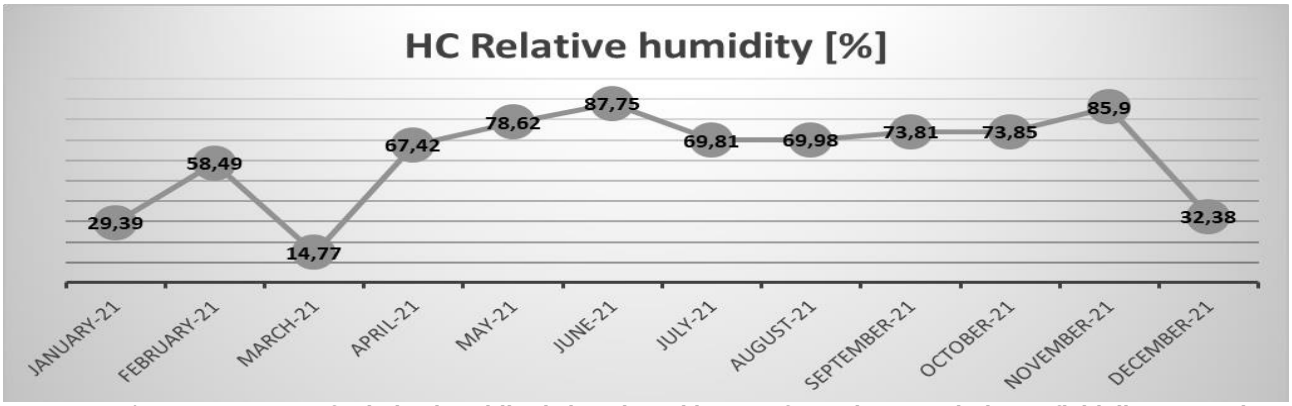

Figure 3 **Average of relative humidity (%) registred in 2021 for Iasi, Romania (www.fieldclimate.com)**

Optimal temperatures of 17-20°C and high atmospheric humidity are mentioned in specialized literature (Sesan T.E., Crisan A., 1998) for ascospore infections. Such conditions of lower temperatures and high humidity were also recorded in the spring of 2021, when in May-June the average of recorded temperature was between 15.19 °C and 19.79 °C.

In flowering woody ornamentals, descriptions of disease indicate that ascospores initiate infection (Grabowski M.A., 2017). The floral elements, especially the stamens and the pistil, are the most sensitive to infections by ascospores. Thus, considering cool and wet weather registered in 2021 for Iasi, Romania favored ascospores of the fungus to initiate infection in *Forsythia* spp. plants, on which water-soaked lesions were observed on the flower petals.

The lesions progressed into branch tissue resulting the wilting of individual branches (*figure 4*).

Figure 4 **Wilted branches of *Forsythia* spp. attacked by *Sclerotinia sclerotioum***

Necrotic tissues from the affected branches were examined and we observed that were covered with patches of fluffy white mycelia, and sclerotia (*figure 5*).

Figure 5 **Necrotic tissues of *Forsythia* spp. with patches of white mycelia and sclerotia.**

After what treated tissues were transferred to potato dextrose agar (PDA) medium and cultured at 25°C the fungus was isolated from infected tissues of *Forsythia* spp. and cultured forwards on PDA medium. The fungus started to produce white masses when growing to the edge of the Petri dish. As time proceeded, the size of mycelium masses became bigger, their colors became darker and finally, many sclerotia formed (*figure 6*).

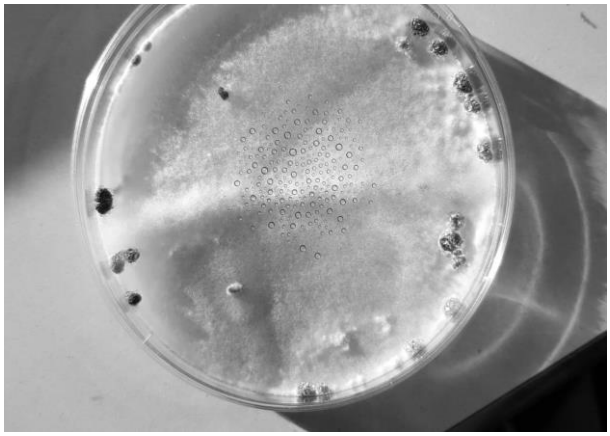

Figure 6 **Sclerotia starting to develop on PDA medium plate.**

Both preserved infected tissues and isolated *Sclerotinia sclerotiorum* fungus in pure culture from plants of *Forsythia* spp. are therefore prepared for PCR testing.

CONCLUSIONS

Through this paper work it is the first report of *Sclerotinia sclerotiorum* (Lib.) de Bary (1884) on the ornamental plants of *Forsythia* spp. in Romania that appear in a scientific work indexed in the international database.

In order to confirm the presence of Sclerotinia sclerotiorum in Forsythia plants, we further intend to amplifie its ribosomal DNA (rDNA) by polymerase chain reaction (PCR), and compared the sequence with the known rDNA sequences in GenBank.

Infected tissues of Forsytia spp. plant with Sclerotinia sclerotiorum (Lib.) de Bary (1884) were included in Herbarium Mycologicum Moldavicum" C. Sandu Ville", from the Faculty of agriculture of the "Ion Ionescu de la Brad" Iasi University of Life Sciences (IULS).

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